

What we claim is:

1        A fuel injector comprising:

          a fuel passage,

5        a valve disposed on the fuel passage,

          a valve seat that receives the valve,

          a jet opening that is formed in the valve seat and through which fuel is exhausted, the jet opening being opened when the valve is moved apart from the valve seat, and

10        a jet opening downstream channel that extends downstream from the jet opening through the valve seat and communicates the jet opening to the outside, the diameter of the jet opening downstream channel being arranged and adapted such that the valve seat has a wall thickness to prevent leakage of noise to the outside through the valve seat, which noise is caused by contact of the valve with

15        the valve seat.

2        The fuel injector as set forth in Claim 1, wherein:

          the diameter of the jet opening downstream channel is designed so as to ensure the diffusability of the fuel exhausted from the jet opening.

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3        The fuel injector as set forth in Claim 1, wherein:

          the jet opening downstream channel has a region in which its diameter is substantially double the diameter of the jet opening.

25        4        The fuel injector as set forth in Claim 1, wherein:

the diameter of the jet opening downstream channel is substantially double the diameter of the jet opening at least in a region right below the jet opening.

5 5 The fuel injector as set forth in Claim 1, wherein:

length of the jet opening downstream channel along its longitudinal axis is substantially the same as or larger than the diameter of the jet opening downstream channel.

10 6 The fuel injector as set forth in Claim 1 further comprising a first channel and a second channel within the jet opening downstream channel, wherein the first channel is formed in the region right below the jet opening and having a diameter substantially double the diameter of the jet opening and the second channel is continuously and smoothly connected to the first channel, while the 15 second channel is conically enlarged away from the jet opening.

7 The fuel injector as set forth in Claim 1, wherein:

the diameter of the jet opening downstream channel is substantially double the diameter of the jet opening over its entire region.

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8 The fuel injector as set forth in Claim 1 further comprising a first channel and a second channel within the jet opening downstream channel, wherein the first channel is formed in the region right below the jet opening and having a diameter substantially double the diameter of the jet opening, and the second 25 channel has a diameter larger than the diameter of the first channel over the

entire region of the second channel.

9        The fuel injector as set forth in Claim 1 further comprising within the jet opening downstream channel:

5            a first channel formed in the region right below the jet opening, the first channel being arranged and adapted to have a diameter substantially double the diameter of the jet opening such that the valve seat has a wall thickness to prevent leakage of noise to the outside through the valve seat, which noise is caused by contact of the valve with the valve seat, and

10           a second channel formed on the downstream side of the first channel, the second channel being designed to have a diameter larger than the diameter of the first channel over its entire region, thereby ensuring satisfactory diffusion of fuel exhausted from the jet opening.

15 10       The fuel injector as set forth in Claim 9, wherein the first channel and the second channel are continuously and smoothly connected to each other.

11       A fuel injector comprising:

          a fuel passage,

20           a valve disposed on the fuel passage,

          a valve seat that receives the valve,

          a jet opening that is formed in the valve seat and through which fuel is exhausted, the jet opening being opened when the valve is moved apart from the valve seat, and

25           a jet opening downstream channel that extends downstream from the jet

opening through the valve seat and communicates the jet opening to the outside, the jet opening downstream channel defining means for providing a wall thickness of the valve seat so as to prevent leakage of noise to the outside through the valve seat, which noise is caused by contact of the valve with the

5 valve seat.